

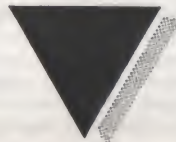
V2-10



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## INSTRUCTIONS



PLEASE READ THIS  
BOOKLET BEFORE  
USING THE EXPERT CARTRIDGE

INTRODUCTION.

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THE EXPERT CARTRIDGE from TRILOGIC, BRADFORD, ENGLAND.

INTRODUCTION.

OPERATING SYSTEM - V2.10

The EXPERT cartridge is the ONLY user programmable cartridge for the Commodore 64 and 128 (64 mode). The functions performed by the EXPERT are almost entirely dependant upon the resident software which is 'loaded' into the cartridge from disk or tape (where available) during the Programming stage. So, whereas other 'old fashioned, low tech' ROM based cartridges cannot be upgraded other than by being returned with an often sizeable upgrade fee to the manufacturer, the EXPERT costs only £2.00 to upgrade if you return the original disk (or only £3.50 if you don't).

The current software version (V2.10), consists of no less than thirteen programs listed below. Some of them are loaded into the cartridge to do a specific job eg Sprite Extraction, whilst the others can be used without the EXPERT or for an associated function.

THE V2.10 MASTER DISK CONTAINS:-

<u>PROGRAM NAME</u>	<u>FUNCTION</u>
1) MAIN BACK-UP 2.10	FREEZING, SAVING TO DISK & FULL M/CODE MONITOR.
2) NO BLOCKS BOOT.	SPECIAL MENU GENERATOR & BACK-UP TURBO RELOADER.
3) SPRITE EXTRACTOR	FREEZE, SHOW, SAVE SPRITES, M/CODE MONITOR.
4) EDITOR SPRITES	EDIT SPRITES PREVIOUSLY SAVED.
5) IMMORTALISER	KILLS SPRITE COLLISION-DETECTION.
6) SCREEN GRABBER	SAVES A HIRES 'PICTURE' ON DISK
7) BOOT FOR HIRES	SPECIAL MENU GENERATOR & FAST RELOADER FOR PICTURES
8) KAOLA CONVERTER	CONVERTS EXPERT HIRES PICTURES TO KAOLA FORMAT.
9) MULTI BACK V2.9	FREEZE & SAVE MAIN PART OF MULTI PART GAMES.
10) MULTI FILES	TRANSFERS MULTIPART SUBSEQUENT PROGRAM FILES.
11) DISK/TAPE V2.4	TRANSFERS EXPERTED PROGRAM FROM DISK TO TAPE.
12) BOOT	SIMILAR TO 2) FOR SOME NON-COMMODORE DRIVES.
13) TAPE TO TAPE	THE TAPE TO TAPE OPERATING SYSTEM.

PART 1. THE PROGRAM PARALYSER & BACK-UP GENERATOR.

SECTION 1: A STEP BY STEP GUIDE FOR TRANSFERRING PROGRAMS TO DISK.

A more detailed explanation can be found in section 2.

- 1) NEW A DISK FOR SAVING BACK-UPS OF YOUR PROGRAMS.
- 2) SWITCH OFF THE COMPUTER & INSERT THE EXPERT AND SET TO PRG POSITION.
- 3) INSERT EXPERT MASTER DISK AND TYPE: LOAD"MA\*",8 (return)
- 4) TYPE RUN (return) & THEN FOLLOW THE ON-SCREEN INSTRUCTIONS.  
(Pressing SPACE to continue when you have read the instructions.)
- NB INSERT A PENCIL POINT TO PRESS THE RESET BUTTON IF YOUR EXPERT HAS THE RECESSED TYPE OF BUTTON FITTED.
- 5) TYPE N (return) & THEN SWITCH-OFF THE EXPERT WHEN THE COMPUTER HAS RESET.
- 6) LOAD AND RUN THE PROGRAM YOU WISH TO FREEZE.
- 7) SWITCH-ON THE EXPERT AND TAP RESTORE TO STOP THE PROGRAM  
(or USE THE ESM BUTTON TO DO THIS IF THE LED IS LIT)
- NB INSERT A PENCIL POINT TO PRESS THE ESM BUTTON IF YOUR EXPERT HAS THE RECESSED TYPE OF BUTTON FITTED.
- DO NOT USE THE RESET BUTTON TO STOP A PROGRAM OR YOU WILL ERASE IT.
- 8) INSERT YOUR BLANK DISK AND TYPE: Z"PROGRAM NAME" (return)  
WHERE PROGRAM NAME IS THE NAME OF THE PROGRAM YOU ARE TRANSFERRING.  
WAIT FOR THE DOT PROMPT TO REAPPEAR BEFORE TOUCHING THE KEYBOARD AGAIN.  
THAT'S ALL THERE IS TO IT - If you want to add more programs to the back-up Disk simply repeat steps 5 to 8.
- TYPING R (return) WILL RESTART MOST PROGRAMS FROM WHERE YOU STOPPED THEM  
Section 3 will help you sort out any problems.
- 9) FINALLY, IF YOU HAVE NOT ALREADY DONE SO, COPY THE "BOOT" PROGRAM FROM THE EXPERT MASTER DISK ON TO YOUR BACK-UP DISK. (SEE SECTION 2, step 1)

SUMMARY OF COMMANDS USED SO FAR.

- N - RESETS & INITIALISES THE COMPUTER PRIOR TO LOADING A GAME.
- R - RESTARTS A PROGRAM FROM WHERE IT WAS STOPPED.
- Z - CAUSES A PROGRAM TO BE SAVED ON DISK IN COMPACTED, ONE FILE FORMAT.

SECTION 2: DETAILED INSTRUCTIONS FOR TRANSFERRING PROGRAMS TO DISK.

PREPARING A DISK FOR BACK-UPS.

- 1) INSERT THE EXPERT MASTER DISK INTO THE DRIVE AND TYPE:-  
LOAD"N\*",8 (return) AND THEN TYPE: RUN (return)  
This loads the "NO BLOCKS BOOT" & FAST FORMATTING PROGRAM.  
If you need to format a disk to hold your back-ups, press F5 and then follow the on-screen instructions. The disk name can be up to 16 characters long.  
The disk ID is two characters long and MUST vary from disk to disk.



- 2) PRESS F3 TO SAVE THE "NO BLOCKS BOOT" PROGRAM ONTO YOUR BACK-UP DISK.  
PRESS F8 TO EXIT THIS PROGRAM AND RESET BACK TO BASIC.

The "No Blocks Boot" program is needed to generate a menu of the programs on your back-up disk and to reload whichever you select at turbo speed. You must use this program to reload any file longer than 202 blocks.

Programs can be reloaded with other fast load utilities or by simply typing:-  
LOAD"PROGRAM NAME",8 (return)

#### A NOTE FOR ENHANCER DISK DRIVE USERS.

You may not be able to use the "No Blocks Boot" program with this drive. On the EXPERT MASTER disk is a program called "BOOT" which has the same function but there are two points to remember:-

- 1) This version of "BOOT" MUST be the first file on the disk.

- 2) It does occupy a small amount of disk space.

To copy "BOOT" onto your back-up disk, insert the EXPERT MASTER disk & type:-  
LOAD"BOOT",8 (return) Now insert your back-up disk & type:- SAVE"BOOT",8  
SETTING UP THE COMPUTER READY FOR SAVING OUT A PROGRAM TO DISK.

- 3) SWITCH OFF THE COMPUTER & INSERT THE CARTRIDGE WITH THE SWITCH IN THE 'PRG.' POSITION AND TURN ON THE COMPUTER.

- 4) INSERT THE EXPERT MASTER DISK INTO THE DRIVE.

- 5) TYPE: LOAD"MA",8 (return) THEN: RUN (return)

This loads the cartridge with the operating software.

- 6) NOW FOLLOW THE ON-SCREEN INSTRUCTIONS; PRESSING SPACE TO CONTINUE.

- 7) TYPE N AND PRESS RETURN.

This completes the programming and initialisation of the computer. You can now load and run the program you wish to freeze and/or back-up.

See section 3 if you encounter any problems.

#### FREEZING A PROGRAM.

- 8) SWITCH THE EXPERT 'OFF'.

- 9) NOW LOAD AND RUN THE PROGRAM YOU WISH TO SAVE TO DISK.

Ensure that your program BACK-UP disk is in the drive.

- 10) WHEN YOU WANT TO FREEZE THE PROGRAM, SWITCH THE EXPERT 'ON' AND THE TAP THE RESTORE KEY ONCE. Do NOT use the RESET button.

The screen will now clear and display the 'Register Block' but this can be ignored for the moment. The Dot prompt on the fourth line shows that the Expert's monitor is waiting for you to input a command. It is from within this monitor that all the EXPERT's functions are controlled.

#### SUMMARY OF COMMANDS YOU MAY WISH TO USE AT THIS STAGE.

N - RESETS & INITIALISES THE COMPUTER PRIOR TO LOADING A PROGRAM (NEWS MEMORY)

R - RESTARTS MOST PROGRAMS FROM WHERE THEY WERE STOPPED.

B - LISTS THE BASIC PARTS OF A PROGRAM (IF ANY).

\$ - DISPLAYS THE DISK DIRECTORY.

+ - CHANGES THE SCREEN COLOURS. FOLLOW THE + WITH 3 DIGITS, 0 TO F FOR EACH, TO SET THE BORDER, BACKGROUND & TEXT COLOURS RESPECTIVELY.

#### SAVING A PROGRAM ON DISK

- 11) TO SAVE THE PROGRAM TO DISK USE THE Z COMMAND.

TYPE: Z"PROGRAM NAME" (return)

where PROGRAM NAME is the name of the program you are saving.

(16 characters max)

The program will be compacted first as indicated by the flashing striped border colours. This compacting process substantially reduces the amount of disk spaced needed for your programs. When this has finished, the program will be saved on disk. This may take up to 3mins, depending upon the size of the program.

The DOT prompt will then reappear. Do not touch the keyboard until then.

You can now, if you wish, again restart the program with the R command.

- 12) TO SAVE MORE PROGRAMS, PRESS N (return) TO RESET BACK TO BASIC.

- 13) YOU CAN NOW REPEAT THE LOADING/FREEZING/SAVING PROCESS FROM STEP 8

#### LOADING BACK PROGRAMS FROM DISK.

THE CARTRIDGE IS NOT REQUIRED. - NO NEED TO UNPLUG, JUST SWITCH TO 'OFF'.

- 14) INSERT YOUR DISK OF BACK-UP PROGRAMS AND TYPE:-

LOAD"B",8 (return)

- 15) USE THE CURSOR DOWN KEY OR JOYSTICK TO SELECT THE PROGRAM YOU WISH TO LOAD, AND PRESS RETURN OR 'FIRE' TO LOAD IT.

- 16) ONCE THE PROGRAM HAS LOADED (after about 30 seconds) PLEASE WAIT A FEW SECONDS FOR IT TO UNCOMPACT AND RESTART.

PLEASE SEE SECTION 3 IF BACK-UP FAILURE OCCURS.

#### SECTION 3. HELP - POSSIBLE PROBLEMS.

- 1) DISK DRIVE MISALIGNMENT.

If the computer hangs-up during the programming procedure, it is possible that your disk-drive is slightly out of alignment. If the red disk-drive error light flashes during programming, then this is almost certainly the case. To get around this, make a back-up of the EXPERT MASTER disk using (preferably), a slow disk copier program such as the one supplied by Commodore with the drive.

- 2) FAULTY DISKS & FORMATTING.

Fast formatting utilities, including the one incorporated into the No Blocks Boot program, are not very reliable. Faulty disks - eg 'bad' sectors & format failure give similar symptoms: the disk may keep on spinning after saving a program, the drive error light may stay on or flash, and listing the directory will show "0 blocks" saved and \*PRG next to the program you were trying to save. If there is insufficient space on the disk you may get these symptoms too.

### 3) WRONG Q VALUE.

The Q command is very important - the wrong Q value will most likely cause your back-up version to hang-up.

Because programs transferred to disk or tape with the EXPERT do not need the cartridge plugged in for loading back, a small amount of memory is needed for the program to be uncompact and reorganised just prior to restarting. However, with most programs these days, there is very little spare memory left and what available space there is varies in amount and location from one game to another.

When you press RESTORE, immediately, the EXPERT operating system attempts to find a free block of about 227 bytes where the uncompact routines are stored. These routines are now incorporated into the program and saved with it. The area found is shown by the two digits - the Q value - which appears in the upper left corner of the screen when you press RESTORE. The Q value shows where the free block is located and by adding two zeros to the Q value you can find the actual block used. Eg, Q = 04; block used = 0400 to 04E1. If the Q value is preceded by a minus sign then part of the screen memory has been used since the system could not find any other area. The side effect of this is that part of the screen will be corrupted on reloading but if you stop the game near the start - on a menu screen say, then when the game gets going, the new screen will overwrite the corrupt one.

It is possible that with future games, this "automatic" Q value finder could be defeated. So to find a free area yourself, use the M command to 'look' through the memory starting from 0400. Then when you have found what could be an unused area of 227 bytes (minimum) commencing at the beginning of a block set the Q value manually using the Q command.

NE A block starts when the last two digits of the first location end in 00 & 227 bytes is E1 in Hex so the area must extend to xxE1.

For example, Typing M 0400 (return) and using the space bar to pause the scrolling, could show that a possible free area starts from 0460 to 0506. The nearest block begins at 0500 so from 0500 to 05E1 would be the area to use so set the Q value to 05 by typing: Q 05 (return). Don't omit the space.

### 4) PROGRAM WILL NOT RUN.

Some programs will not run if a disk drive is connected although they will load normally. If this happens, switch off the drive until you are ready to save the program. Eg Green Beret.

### 5) EXPERT ACTIVATED UNEXPECTEDLY.

Some programs generate NMIs which activate the cartridge unexpectedly. By leaving the switch in the off position until just prior to pressing the RESTORE key to stop the program, this problem can be overcome in most cases. Eg Spiky Harold & Iridis Alpha.

### 6) PROGRAM WILL NOT LOAD.

Some programs will not load, apparently detecting that the EXPERT is connected even though it may be turned off. They are in fact simply detecting that the memory has been altered from what it would have been had the computer just been powered up.

Type P (return) instead of N return if this happens. This will reset the machine in a slightly different way. Typing: P XY (return) will fill the memory with XY (where XY is any two digit number in HEX from 00 to FF) but with other random bytes inserted here and there. Only use P as a last resort since the compactor works more effectively with N. Also try W (return) - this will perform a 'warm' start, and finally, as a last resort, after going back to Basic with N (return), switch off the EXPERT and press the RESET button. (Use this method to load Dragon's Lair (disk version).

### 7) FAULTY RESTORE KEY.

The RESTORE key is seldom used, and in some cases, does not work. If tapping it with the EXPERT programmed & switched on, does not cause the monitor prompt to appear, then a fault with this key & associated circuitry is probable. Try this test: hold down the RUN/STOP key and tap RESTORE with the EXPERT switched off or unplugged. The screen should clear and 'READY' be displayed on the top line. If not, then your computer requires attention. If this test is passed, then a fault within the EXPERT is indicated.

### 8) OTHER BACK-UP FAILURES

See under "CHEAT MACHINE" for some tips needed for a few more heavily protected games. (incl Delta, Scooby Doo, etc etc)

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### 9) THE ESM BUTTON & LED.

Some games have protection which renders the RESTORE key inoperative & will corrupt the EXPERT if it is switched on during loading of the game; usually, with these games, the RED led will glow.

The procedure is then to keep the switch in the Off position until the led glows steadily and then switch on the EXPERT. Next, press the ESM button (using a pencil point if necessary) once to stop the game. The EXPERT will then work as normal - but note, you may not be able to use the R command. eg WAR, SANXION, ALLEYKATS, KRACKOUT, YIE AR KUNG FU II, IRIDIS ALPHA, DELTA.

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## PART 2. THE SPRITE EXTRACTOR, EDITOR & SAVER.

This utility enables you to freeze a program, display the sprites (if any), view the sprite animation, and save them on disk for later editing or customising. You can then insert them into other games in place of the existing ones. Many of the other monitor commands are available too, so you can restart or save or 'look' through the memory as well as view the sprites.

But what are sprites? Almost all games have moving objects - space ships, missiles etc and changing their shape and moving them about on the screen would be a slow, tedious process if it was not for a special feature of the Commodore video chip. This feature allows objects (ie sprites) which we want to move about to be predefined in the computers memory, and then moved as a whole by simply instructing the video chip where to move them. We can also have the video chip detect sprite to sprite collisions and sprite to character collisions for us.

Sprite animation is an illusion produced by defining several sprites each slightly changed. For example, to give the effect of rotating a space ship, many sprites would be defined in the memory, each based on a different 'view' of the space ship as it would appear if rotated in steps. Displaying them in turn therefore gives the illusion of rotation - the faster the rate of displaying the sprites, the faster the rotation.

There can be upto 8 sprites on the screen at any one time, but there could actually be dozens of sprites defined in the memory ready to be displayed as the game progresses. There are 4 blocks of 16K where sprites can be found - all are accessible with this utility, although not all blocks may actually be used in any one game.

### SECTION 1 - PROGRAMMING THE EXPERT FOR SPRITE EXTRACTION.

- 1) Turn the switch to PRG and insert the EXPERT Master disk into the drive.
- 2) TYPE: LOAD"SP\*",8 (return) and then RUN (return) when it has loaded.
- 3) Follow the on-screen instructions - Pressing SPACE to continue; N to initialise the memory.
- 4) Now load and run your favourite game.
- 5) Freeze the game using RESTORE (not RESET) or the ESM button as described in PART 1 when the sprites you wish to save or edit are on the screen.

### SECTION 2 - VIEWING & SAVING SPRITES.

When you stop the game you can view 8 sprites on the screen by pressing F1 or F7 until the sprites appear. If the expected sprites don't appear, press B (return) to select the next video bank and then F1 or F7, repeating these steps until you find the sprites. (Sprites can be in one or more video banks, of which there are four, so F1 or F7 together with the B command enables you to view all the sprites in a game.

The leftmost sprite is sprite No.1 and the first 4 (left to right) are in two colour HIRES mode and the remaining 4 are in multicolour mode.

NB Not all sprite positions are used so some sprites will appear to be made up of random characters.

To save a sprite, use F1 to move it into position 1 and then type: S"SPRITE NAME" (return)

### SPECIAL COMMANDS.

- F1 Scans forward through the sprite memory - this has the effect of showing the stages in the animation of sprites.
- F7 A5 F1 but scans in reverse - back through the memory.
- B Change video bank. (press B return, on the 5th press you will be back to the first bank again)

L"SPRITE NAME" Loads named sprite from disk & inserts it in position 1.

L Loads last sprite from disk.

Y Turns sprites off and restores full screen for monitor use.

S"SPRITE NAME" Saves sprite No.1 (the leftmost one)

Krm Changes the sprite colours. NOTE: the sprite will be restored to its original colour when you restart the game.

n is 0 to 7 to change the first colour of sprites 1 to 8;

n is 8 to change the second colour of the last 4 sprites together. \*

n is 9 to change the third colour of the last 4 sprites together. \*

m defines the colour - range 0 to F.

\* The last 4 sprites are in multicolour mode and have three colour options.

R This will Restart most games.

Z This will compact & save the entire program to disk complete with the current sprites - the original ones or some that you may have previously extracted or customised and loaded in using the L command.

Please note, the following monitor commands are NOT available A, D +, @ and the L, S, B & K commands now have the functions listed above. The other monitor command are available see PART 6 for more details.

### SECTION 3 - THE SPRITE EDITOR.

Before using the Sprite Editor program, you MUST SAVE the sprites you wish to edit on disk.

The sprite editor program does not use the EXPERT so press N (return) to go back to Basic.

Now type: LOAD"ED\*",8 and then RUN when it has loaded.

The screen will show a box in which the sprite to be edited is loaded.

### SPECIAL EDITING COMMANDS.

<u>COMMAND</u>	<u>FUNCTION</u>
F1	followed by the sprite name will load in the sprite.
F3	followed by the sprite name will save the sprite on disk.
F7	lists the directory.
CURSOR KEYS	move the editing cursor within the box.
M	toggles between HIRES & MULTICOLOUR mode.
I	inverse video.
R	scroll right (wraps around)
L	scroll left (wraps around)
U	scroll up
D	scroll down
X	horizontal mirror image.
Y	vertical mirror image.

- SHIFTED 1 changes sprite colour 1 - hold down the keys to show each in turn
- SHIFTED 2 changes sprite colour 2 " " "
- SHIFTED 3 changes sprite colour 3 " " "
- SHIFTED 4 changes the border/text colour.
- SHIFTED 5 changes the background colour.

The current colours are shown by small 'indicators' below the bottom right corner of the box - an arrow shows which is in use at any instant.

- 1 selects pixel colour 1
- 2 selects pixel colour 2
- 3 selects pixel colour 3 (only operates in multicolour mode)
- \* inserts a pixel at current cursor position.

#### EDITING A SPRITE

Load in a sprite already saved - it will be shown in the box. Now move the editing cursor (a pixel sized 'window'). Press \* when you want to insert a new pixel, or space if you want to delete one. The pixel will appear in the one of the current colours; the arrow pointing at one of three 'indicators' below the bottom right corner of the box shows which colour is in use. SHIFTED 1, 2 or 3 will change each of the colours (hold down the shift & number key until your choice of colour is shown). Pressing 1,2 or 3 will move the arrow and select the actual pixel colour.

NB 1 These colours are for editing ONLY - when you insert a sprite into a game, the colours will be reset to those used in the game - this is unavoidable since the sprite colours are defined as the game progresses.

NB 2 In multicolour mode the resolution is half that of HIRES mode. When you are satisfied with the alterations, press F3, enter the sprite name and the sprite will be saved.

#### SECTION 4 INSERTING A SPRITE INTO A GAME.

Program the EXPERT with SP\* as detailed in section 1 above if you have not already done so.

- 1) Tap RESTORE and then N (return) to NEW the memory.
- 2) Load the game - type: LOAD"B\*",8 and then RUN and use the cursor key to select from your list of transferred games (assuming you have already saved the game on disk).
- 3) Tap RESTORE to freeze the game when the sprites you want to alter appear.
- 4) Use F1 or F7 to show the sprite to be replaced in position 1.
- 5) Now type: L"SPRITE NAME" from within the monitor.
- 6) When your customised sprite appears on the screen, you can save or restart the game in the usual way.

NB The colours will be reset as mentioned above.

#### PART 4 - THE SPRITE IMMORTALISER.

This version of the operating system enables you to disable sprite to background and sprite to sprite collision detection thus giving infinite lives etc. Please note that the effect varies from game to game, with many, no effect, or an unexpected effect will result.

- 1) Program the EXPERT by typing: LOAD"IM\*",8 and then RUN it.
- 2) Follow the on-screen instructions, pressing space to get into the monitor.
- 3) Type N (return) to go back to Basic and then load and run the game.
- 4) Stop the game with the ESM button if necessary and then type:-  
KB (return) to kill the sprite to background collisions and  
KS (return) to kill the sprite to sprite collisions.

The border will flash whilst the EXPERT searches through the game looking for and disabling any collision detections. Any found will be listed. If the monitor prompt appears with no addresses listed, then no collision detection routines were found.

All the other monitor commands except B & K are available - you can restart the game with R or save it with Z as described in PART 1.

#### PART 4 - THE HIRES GRABBER & PICTURE SAVER.

This utility enables you to save a hires picture on disk. You can then edit/customise it using Kaola Pad or similar utilities. Please note, it is NOT possible to put a hires picture back into a program. A special 'Hires Boot' program is copied onto your picture disk (reserve this disk only for pictures - preferably don't use a disk which has program files on it.)

#### SECTION 1 - PUTTING THE HIRES BOOT PROGRAM ON YOUR PICTURE DISK

- 1) Insert the EXPERT Master disk & type: LOAD"BO\*",8 and then RUN it.
- 2) Follow the on-screen instructions - format a disk if necessary  
Remove the Master disk and insert a blank one.  
Press F5 to format this separate disk for storing your pictures.  
Press F3 to put the BOOT HIRES SC program on this disk.

NB. Hires Boot must be present or your pictures will not reload correctly.

#### SECTION 2 - PROGRAMMING THE EXPERT WITH THE SCREEN GRABBER.

- 1) Switch to PRG and type LOAD"SC\*",8 and then RUN (return).
- 2) Follow the on-screen instructions:-
- 3) Press SPACE to get into the monitor and then type: N (return)

#### SECTION 3 - CAPTURING & SAVING A HIRES SCREEN.

- 1) Now load the game, switch the EXPERT on and tap RESTORE, (or use the ESM button) when the picture you want to save comes up. If it is a loading screen press RESTORE as soon as it appears - don't wait for the game to load.
- 2) Save the picture by typing: B"PICTURE NAME" (return)



#### SECTION 4 - CONVERTING THE HIRES FILE INTO KAOLA FORM.

Before you can use the EXPERT's version of a Hires picture with Kaola Pad, you have to run a conversion program. This converts an EXPERT Hires picture file into Kaola format. Once you've altered it, you then convert it back into EXPERT format.

1) Type: LOAD"KA\*",8 and then RUN it.

2) Select which conversion you want:-

PRESS 1 for EXPERT HIRES TO KAOLA

3) Enter the file name to be converted and press return. Then enter a unique letter between A & P to identify the file.

The file will be converted and resaved in one operation. If you list the directory, you will see that the original file has been renamed (& shortened where necessary) and the unique letter incorporated into the new name.

You can now use Kaola Pad to alter the picture and then save it. To reload it with the EXPERT Hires Boot you will first have to convert it back again. So repeat steps 1 and 2 above. At step 3, enter the Kaola file name, ignoring the inverse "heart" character, and press return.

#### THE CHEAT MACHINE - HOW TO ENTER CHEATS

We are indebted to the EXPERT USER CLUB for the following selection of cheats reprinted from their recent newsletters.

##### HOW TO ENTER CHEATS.

1) Stop the game using the ESM if necessary.

2) Type in the cheat - Use the D command to "list" a line of the program (put a full stop after the address to list only the one line) and then use the cursor keys to locate the numbers to be changed and then overtype with the values given in the cheat. When you press return, other parts of the line may change too - this is okay.

3) Alter the restart address using the / command where stated.

4) Restart the game by using the R command to test out the cheat.

5) Save the altered game using the Z command

#### SOME CHEATS FOR YOU TO TRY.

1) KRAKOUT - infinite lives.

Turn off the EXPERT until the ESM light glows, then switch on. it will jump into the monitor when loaded. Now type:- D AD64. (ret) and change it to read .. AD64 EA EA EA (ret) Now save it in the normal way. Keep the Expert Off when reloading. The Restart function will not work with this game - it keeps jumping back into the monitor.

2) MUTANTS - infinite lives.

Switch on the EXPERT when loaded and tap Restore, then type:- D 2439. (ret) and change the line to read: .. 2439 EA EA EA (ret) Alter the restart address to \$1000 (type: /1000 (ret)). Now save/restart as per usual.

3) SANXION - infinite lives.

Turn on the EXPERT when ESM light glows. When loaded, press ESM button and then type:- D 373E. (ret) and change the line to read: .. 373E EA EA EA (ret). Save/restart as per usual.

4) SPIKY HAROLD - sprite collision disabled.

Leave the EXPERT on, it will jump into monitor when loaded. Now type:- D 9500. and change it to read .. 9500 A9 00 EA (return). Now type:- G FCE2 (return) to reset the computer, switch off the EXPERT and enter SYS 28672 (return) to restart the game.

5) KORONIS RIFT - immortality.

Stop the game and type:- F 083E 0840 EA (return)

6) EIDOLON - infinite energy

Stop the game & type:- F 5CEE 5CEE AD (return)

7) ELIDON - unlimited sets of wings.

Stop the game and type:- D 0B0F. and alter the line to read:- 0B0F EA EA EA DEC \$ 0421

8) BOULDEROASH 3 - infinite lives.

Stop the game & type:- D 876E and change the line to read: D 876E EA EA  
Alter the Restart address to 8D67. (/8D67)

9) PSYCASTRIA - infinite lives.

type: D 4F52. and change the line to read: D 45F2 EA EA  
Restart address is 4000

10) 1942 - infinite lives.

Stop the game and type: D 16AE. now change the line to read:-  
D 16AE EA EA EA DEC \$6F

11) NODES OF YESOD.

Type: D 801A and change it to read: D 801A EA EA EA LDA \$ D01E  
Type: R (return) to restart it.

12) FIST 2 - see what happens ?

Load and run FIST 2, stop the game and type:-

A 2556 LDA \$100 (return)

A 2558 LDA STA \$ 0478 (return)

A 2558 NOP (return)

Restart the game (R return)

- 13) DROPZONE - infinite lives.  
Load & run the game, press RESTORE to stop it and type: M 0BF4.  
change the line from: 0BF4 CE B4 B8 20 90 A9 A9 00  
to: 0BF4 EA EA EA 20 90 A9 A9 00 (return twice)
- 14) CRAZY COMETS - unlimited lives  
Type: D 90AA. (return) and change the line to:-  
90AA EA EA EA NOP (return twice). R to restart.
- 15) WARHAWK - for unlimited energy type: D 69D2. and change to:-  
69D2 A9 00 E7 LDAI\$00 (return twice).
- 16) PARADROID. for infinite energy type: D 143E and change the line to:  
143E EA EA EA (return twice)
- 16) INFILTRATOR  
for infinite bombs type: F 1C54 1C54 EA (return)  
for infinite spray type: F 0D09 0D0B EA (return)  
for infinite time type: F 24A7 24A9 EA (return)  
and F 2498 249A EA (return)  
and F 2442 2444 EA (return)  
and finally, R (return) to restart the game.
- 
- TRICKY GAMES - you need to do a bit of jiggery pokery before you can  
successfully save the following games.
- 1) DELTA.  
When it has loaded, switch on the EXPERT and press the ESM button. On  
the register display, you will see one called SP above a two digit number.  
Locate the cursor over this number and type FF (return). Now type:- /1770 to  
set the restart address to \$1770. You can now save the game in the normal  
way.
- 2) KRAKOUT Use the ESM to stop the game. Now type:- X (return), then:-  
F DC75 DC75 19 (return). You can now save the game as usual.
- 3) TOMAHAWK - After stopping the game, type: X (return) and then: / 048A  
(ret). Now you can save the game.
- 4) SCOOBY DO. Load the game, and then turn on the EXPERT when loaded. It will  
jump into the monitor. Now type: F 30C0 30C0 EA (return) and then save it.
- 5) URIDIUM 2 and PARADROID 2. Stop the game with RESTORE and then type:-  
X (return) then: F DC67 DC67 00 (return) and now save it.
- 6) YIE AR KUNG FU 2. Switch on when loaded, type: X (return), F DC04 DC04 EB  
then: / CBE4 (ret) and then save. (Q = 44 for earlier operating systems)
- 7) BAZOOKA BILL. Load the game, when loaded press F7 twice to go back to the  
title screen. Now tap RESTORE, and save it. (Q = 2E for earlier o/systems)
- 8) DRAGON'S LAIR. disk version. To back-up this disk version, switch off the  
EXPERT and press RESET before loading the game. It will now load and run  
and can be stopped and saved part by part without any problem.
- 9) TERRA CRESTA. Turn EXPERT off until the light glows. Now switch it on, it  
will jump into the monitor when loaded. Now type: X (return) and save out.
- 10) DRAGON'S LAIR. It seems that it is necessary to stop the game on the the  
score table where it says press fire. You can change the number of lives  
by altering location 0027. (Use M 0027.) Switch off the Expert after using  
the R command. Save in several parts as it is a multi-part game.

## PART 6. THE CODE INTERROGATOR & MACHINE CODE MONITOR.

### INTRODUCTION.

The Monitor software, which is part of the EXPERT CARTRIDGE TAPE TO DISK  
SYSTEM is a very powerful tool with several unique features. The Monitor is  
completely invisible to the user and can be used over the whole of the 64K  
ram. It can be used to access both Basic & Kernal roms and the \$0000 input  
output block registers and ram under the roms and under this block.

Typical uses are: interrogating/inspecting a program, ( M and D  
commands), altering a program (M command), list any Basic parts of a program  
( B command), write a machine code program (A command), convert numbers from  
decimal to hex and vice versa (U & ? commands), search for addresses, data or  
text (H & K commands).

Whenever you tap the RESTORE key (or press the ESM button where  
necessary), the screen will clear and the EXPERT's machine code monitor will  
be activated. It is from within this monitor that all the functions of the  
EXPERT are controlled. The screen will typically look like this:-

OS

```
PC SR AC XR YR SP L1 QA NV-BDIZC
/ 2677 C3 22 44 56 FB 37 05
```

The two digits in the upper left corner are the Q value which has been  
found automatically by the operating system when you stopped the game.

The next line lists the various important registers and below are the

actual values held in the registers at the instant the game was stopped.

PC = PROGRAM COUNTER

SR = STATUS REGISTER

AC = ACCUMULATOR

XR = X REGISTER

YR = Y REGISTER

SP = STACK POINTER

L1 = LOCATION 0001

QA = THIS IS THE CURRENT Q VALUE AS SHOWN ON THE TOP LINE.

NV-BDIZC THIS SHOWS THE STATUS OF THE FLAGS. A FLAG WHICH IS SET IS  
UNDERLINED. You can change any of the flags by altering the SR  
value.

The dot on the fourth line is the machine-code monitor cursor or prompt  
and shows that the EXPERT is in command.

You can change the contents of all the registers by directly overtyping  
the current value with a new one.



ALL THE COMMANDS FOLLOW THE DOT PROMPT (.)  
TYPE THE COMMAND FOLLOWED ONE OR MORE PARAMETERS - AN ADDRESS IN MOST CASES.  
A ? WILL APPEAR IF YOU OMIT A OBLIGATORY PARAMETER.  
EACH COMMAND IS FOLLOWED BY AN EXAMPLE. HEXADECIMAL NOTATION IS USED.  
COMMAND PARAMETER(S) FUNCTION

A 1000 LDX \$00 ASSEMBLES  
Starts assembly at \$1000. in this example the X register is loaded with the value in location \$00. You will then be prompted for the next instruction address. Press RETURN to terminate the assembly.  
A TIP: When using the A command to write a short machine code program use the \$C000 area where possible. This will avoid affecting any Basic programs in memory. Also, to execute the program; type W (return) to exit the monitor and the do a SYS to the start of the program. Eg A C000 LDA \$F60 (return) and so on assembles at C000. Then SYS 49152 (C000 in decimal) to execute it. Don't use the J or G commands unless you know what you are doing "

B BASIC LIST  
This produces a listing of the BASIC part of any program similar to typing LIST in Basic. All anti-listing techniques are bypassed.  
C 1000 2000 3000 COMPARES  
Compares the block from \$1000 to \$2000 with the block at \$3000 to \$4000. The address of any location which differs is displayed.  
D 1000. DISASSEMBLES  
Disassembles one line of code starting from location \$1000. If you omit the final . the disassembly will continue until you press the STOP key, or pause it with the SPACE BAR. This command has been changed in that you can now directly alter the disassembled code by using the cursor keys to locate the characters to be overwritten. Instructions, addresses and data can be altered as necessary. Press return to enter the changes.

D 1000 2000 DISASSEMBLES  
As above but disassembles between the two addresses specified.  
E 2000 20FF 45  
This command EXCLUSIVELY ORs the memory between the start and end addresses given with the byte specified in this case, 45.  
F 1000 2000 XY FILLS  
Fills memory from \$1000 to \$2000 with a value, where XY can be any number from \$00 to \$FF.

G 1000 GOES TO (JUMPS)  
Starts executing a program from location \$1000 using the current register values.  
H 1000 2000 A9 00 FD HUNTS  
Hunts through the memory between \$1000 & \$2000 for the sequence of bytes - in this case A9 00 FD and displays the addresses if any, where they were found.  
H 1000 2000 'HELLO' HUNTS  
Hunts between \$1000 & \$2000 for text string "HELLO" (in ASCII) and displays the addresses if found.

H 1000 2000 "TEST" HUNTS  
Hunts between \$1000 & \$2000 for the screen value of the text string "TEST" (the ASCII sequence found with the previous H command would be 54 45 53 54 whereas the screen sequence given by this command would be 14 05 13 14

I 4000 5087 C0 INCREMENTS  
Increments the area from 4000 to 5087 by C0.

J 5000 JUMP (subroutine)  
Executes a JSR to \$5000 with an RTS afterwards.

K 4000 4FFF 0277 SEARCHES  
Searches between the specified addresses for any references to the location \$0277 including branches.

K 4000 4FFF 0277 0350 SEARCHES  
Searches between the specified addresses for any references to the memory block between \$0277 and \$0350.

K 4000 4FFF 3000 3FFF 70000 SEARCHES  
Searches between the specified addresses for any references to the memory block between \$3000 & \$3FFF and change them to point to the area from \$7000 onwards.

L "PROGRAM NAME" LOADS  
Loads a program from device 8 (disk) to the address from where it was saved.

.L "PROGRAM NAME" 08 2000 LOADS (relocated)  
Loads a program from device 8 to memory commencing from location \$2000.

.M 1000. MODIFIES  
Displays the contents of one line of memory (8 consecutive locations) starting at address \$1000, with the ASCII form on the right of the screen. You can alter the contents of any location with this command. Use the cursor keys to locate the byte you wish to overtype. Enter the new value and press return. The new value will appear in place of the old one unless you are trying to "poke" into a rom location, when the old value will reappear. If you omit the final . the listing will continue until you press the STOP key or pause it with the SPACE BAR.

M 1000 2000 MODIFIES  
As above but displays all memory between the specified addresses.

N NEW  
Fills the 64k ram with the current fill byte & Resets back to Basic.

N XY NEW  
Fills the 64k ram with the byte XY (XY lies within the range 00 to FF)

O Redisplays the current registers.

P SPECIAL NEW  
Fills the memory with occasional random bytes and RESETS back to Basic.

P XY SPECIAL NEW  
Fills the memory with XY (XY can range from 00 to FF) plus occasional random bytes followed by a RESET back to Basic.

Q  
This command will try to find a block of memory suitable for use as explained in section 5 paragraph 2. This command is executed automatically when you enter the EXPERT by tapping RESTORE.

- R Restarts the program you halted by tapping the restore key. Can also be used after saving the program.
- S "PROGRAM NAME" 08 1000 2000 3000 SAVES  
Saves memory from \$1000 to \$1FFF to device 8 (disk) so that it loads back at \$3000.
- S "PROGRAM NAME" 08 1000 2000 SAVES  
Saves memory from \$1000 to \$1FFFF inclusive to device 8 (disk).
- T 1000 2000 3000 TRANSFERS  
Transfers the contents of the memory between \$1000 & \$2000 to \$3000 & \$4000. This is an improved T command. It will transfer between blocks which overlap. eg T 2000 4000 3000
- U UNHEX  
Converts a number from HEX to decimal. (opposite of ? command)
- V "PROGRAM NAME" 08 VERIFIES  
Verifies a program on disk with that in the ram and lists the addresses where there is a difference.
- V "PROGRAM NAME" 08 4000 VERIFIES  
Verifies a program on disk with that in the ram at 4000 and lists the addresses where there is a difference.
- W WARM START  
Causes a warm start similar to pressing RUN/STOP RESTORE.
- X EXCHANGES  
Toggling this key selects the memory map that the monitor is working in. The current map is indicated as either 00 which is all 64k ram or FF which is the normal CBM64 default memory map.
- Z "PROGRAM NAME" SPECIAL SAVE  
Saves the program in a crunched or compacted form on disk.
- ? This converts a number from decimal to HEX.
- / 1000 SET RESTART ADDRESS  
Alters the restart address, in this case to \$1000.
- . Reads the disk error channel.
- .#S:DISKNAME  
Performs the disk command specified.
- # "PROGRAM NAME" SHOW START & END ADDRESSES.  
Displays the start and end addresses of the program.
- .\$ DIRECTORY  
Lists the directory to the screen without corrupting memory.
- + nnn SETS SCREEN COLOURS  
This command allows you to change the screen colours. The digits (in HEX) set the colours in the order: border background text.
- \* SETS SEARCH COMMAND PARAMETERS.  
This command sets the parameters used by the search and hunt commands - (K & H). For example, typing: \* 1000 8000 (return) and then K\* 20 (return) is the same as typing: K 1000 8000 20 (return). It is a useful time saver if you want to search the same block for particular bytes or sequences of bytes.

## PART 7 TAPE TO TAPE TRANSFER

This section explains how to use the EXPERT entirely from tape. Use this section only if you do not have a disk drive, OR if you have a drive, the tape to tape program on the Master disk is used for making a direct tape to tape back-up. Please note, there is no facility for transferring multipart games to tape with the current tape to tape version, nor are the sprite & hires utilities available on tape.

Before you start, have a blank rewind tape ready. Only use high quality data tapes.

### TAPE ONLY USERS - PROGRAMMING THE EXPERT.

- 1) Insert the EXPERT, switched to 'prg' position.
- 2) Put the EXPERT Master tape into the Datasette.
- 3) Press shifted RUN/STOP. After about 40 seconds, the tape will stop and you should now follow the on-screen instructions.
- 4) When the Help screen appears, remove the Master Tape - do not rewind it.
- 5) Press space when ready to continue. The EXPERT's machine-code monitor will then come into operation.
- 6) Type N (return) to initialise the computer and Reset back to Basic.
- 7) Now switch off the EXPERT - not always necessary with most games.

### STOPPING THE PROGRAM

- 8) Load the game you wish to back-up.
- 9) To stop the game, switch on the EXPERT and tap RESTORE once.
- 10) With some programs, the RESTORE key may have no effect or may cause the computer to hang-up. You will therefore, need to use the EXPERT + ESM or ESM module. If the red LED is lit, to stop the program press the small additional button.

At this point, you can use the EXPERT's machine-code monitor to alter, restart or save the game to tape.

### SAVING THE PROGRAM

- 10) Now type Z"" (return) and wait for the program to be compacted. (As indicated by flashing striped border colours - this takes 40 - 60 seconds).
  - 11) Now follow the on-screen instructions.
- To reload a back-up program, use shifted RUN/STOP. Your back-up version should reload in about half the time the original took to load (depending upon which save speed you used).

Please note, the following commands are not available in the tape version:-  
L O I S

### TAPE TO TAPE - FOR DRIVE USERS

Program the EXPERT by switching to PRG and typing LOAD"IA",8 (return). Now follow the on-screen instructions and then carry on from step 5 above.



## PART B - MULTI PART PROGRAMS

The multi-part utility supplied will only transfer early novaload programs such as Summer Games. The procedure is to transfer the main part of the game up to a menu or activity screen in the normal way. Next, a separate program is used to transfer the subsequent parts.

The EXPERT UTILITY DISK No.1 (available late May) will enable many more multipart games to be transferred.

Please have several formatted disks ready before beginning.

- 1) Program the EXPERT by typing LOAD"MULTI F\*",8 and then RUN.
- 2) Press space to enter the monitor and then NN (N twice).
- 3) Load the game and freeze it on a menu screen.
- 4) Type: Z"PROGRAM NAME" (return) wait until it is saved.
- 5) Now type: NN (return)
- 6) Type: LOAD"MULTI F\*",8 and then RUN
- 7) Now follow the on-screen instructions, not forgetting to insert a blank disk in the drive. This program transfers the subsequent files to disk - it does not use the EXPERT for this process.

### NOTES.

- 1) Files of the same name will not be saved by the MULTI FILES program.
- 2) It may be necessary to keep PLAY on the datasette pressed when reloading the disk version.
- 3) Trilogic would like to express their thanks to the EXPERT USER CLUB for permission to use the MULTI BACKUP version of the operating system.
- 4) The following Commands have been changed in this version of the EXPERT operating system:-

I - now shows 32 bytes per line in screen ASCII instead of HEX.

  converts a number from decimal to hex.

5  converts a number from hex to decimal

  replaces X in V2.10

N is now NN

+ increments memory

P is now PP

- decrements memory

U replaces +

X exits to Basic

← replaces O

=====

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THE EXPERT CARTRIDGE - OPERATING SYSTEM UPGRADES.    £2.00  
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Important. Please enclose a good quality ss/sd disk with sleeve, free from other notches, and not damaged, bent or faulty, otherwise we will not be able to forward your upgrade. We can supply a new disk for £1.50 extra incl postage should you wish.

OVERSEAS Please add £1.00 extra.

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TRILOGIC UPGRADE SERVICE

NB Please complete and return this slip with your payment, disk and stamped SAE.

PLEASE STATE WHERE YOU PURCHASED YOUR EXPERT CARTRIDGE.

NAME of SHOP.....  
YOUR NAME ..... Your customer no.(if applicable).....  
YOUR ADDRESS .....  
.....

ACCESS/CASH/POSTAL ORDER FOR £    :    ENCLOSED    Sorry cheques NOT accepted.

ACCESS No. .... Sorry not VISA or AM EX

SIGNED .....    DATE .....

NEW DISK REQ'D    Y / N. MY CURRENT VERSION No. IS ..... (see disk label)